PC Reviewed: 11/13/02   **Status: __A__**   **Priority: __2__**
SC Reviewed: 11/15/02   **Status: __A__**   **Priority: __2__**

1.a. Full Title: Association between diet quality and functional and self-rated health in a bi-ethnic cohort: the Atherosclerosis Risk in Communities Study

  b. Abbreviated Title (Length 26 characters): diet and functional health

2. Writing Group (list individual with lead responsibility first): Denise Houston, June Stevens, Jianwen Cai, Larry Branch, Patricia Dubbert

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3. Timeline: Dataset preparation and analysis will start immediately upon approval.

4. Rationale:

    The African American elderly population is expected to more than triple by the year 2050 while the white elderly population will double[1]. Although there have been recent declines in the disability rate among U.S. elderly, it has been estimated that the number of disabled elderly will triple between 1985 and 2050[2]. With the aging of the population, there is increased emphasis on maintaining functional health and independence of the elderly. Functional

dependence has been shown to predict death, nursing home admission, hospitalizations, and physician visits in persons aged 80 years and older[3] and mortality in persons aged 65 years and older[4, 5]. In addition, poor self-rated health has been associated with functional limitations and increased risk of mortality[6, 7]. In the 1994 National Health Interview Survey among those 70 years and older, African Americans reported higher levels of impaired functional health than whites [8]. Elderly African Americans reported worse self-rated health than whites at every age.

Several studies in predominantly white populations have examined the associations between diet and functional and self-rated health in the elderly using various nutritional risk and healthy eating indices[9-16]. Three of these studies were prospective[14, 15, 17]; however, one had a follow-up period of only one year[14]. To our knowledge, the only study to examine this association in African Americans (n=22) was cross-sectional[10]. The investigators found a positive association between nutritional risk and impaired ADLs and an inverse association between nutritional risk and self-rated health[10]. The association between alcohol consumption and functional and self-rated health has been examined with inconsistent results in predominantly white populations only[12, 16-25]. In addition, several European studies have examined the associations between specific dietary nutrients and functional health[20, 26-28] but only one of these was a prospective study[27].

The U.S. elderly population is projected to increase substantially over the next 50 years. However, little is known about nutrition-related predictors of impaired functional and self-rated health, especially in African Americans. The Atherosclerosis Risk in Communities Study offers a unique opportunity to examine the associations between diet quality and alcohol consumption and functional and self-rated health in a bi-ethnic cohort of men and women as they progress from middle-aged to elderly. We will investigate the associations of diet controlling for chronic disease (CHD, cancer, stroke, diabetes) by using exclusions.

5.   Main Hypothesis/Study Questions:

The following aims will be examined prospectively in analyses stratified by ethnicity and gender:

1. Determine the associations between baseline diet quality and number of servings from food groups and functional and self-rated health assessed at 9-year follow-up.

2. Examine the association between specific nutrients at baseline and functional and self-rated health assessed at 9-year follow-up.

3. Determine the associations between baseline alcohol consumption with functional and self-rated health assessed at 9-year follow-up.

6.   Data (variables, time window, source, inclusions/exclusions):

Food groups will be created using frequencies of foods consumed from the 66-item, semi-quantitative food frequency questionnaire at baseline for the following categories: grains, vegetables, fruit, milk, and meat. A healthy eating index, similar to the USDA Healthy Eating Index, will be created.   As diet may change as a result of disease diagnosis, participants who were diagnosed with coronary heart disease, stroke, cancer, or diabetes at baseline will be excluded.

We are aware of the complex issue involving the temporal sequence between exposures and outcomes in these analyses. For example, poor diet may lead to declines in functional health, and declines in functional health may lead to poor diet. Similarly, intake of alcohol may lead to declines in functional health, and declines in functional health may lead to reduced alcohol intake. This problem of "reverse causality" may only be partially solved by a prospective analysis. We hypothesize that with 9 years of separation between the observation of diet and alcohol intake and functional health, it is reasonable to assert that the problem of reverse causality has been reduced. Nevertheless, it will be recognized in our discussion of results.

Responses to the Physical Ability Questionnaire administered at visit 4 will be used to determine functional health. The questions will be divided into two scales. The mobility scale will include the following questions: walking for ¼ of a mile, walking up 10 steps without resting, stooping/crouching/kneeling, lifting or carrying something as heavy as 10 pounds. The functional ability scale will include the following questions: doing chores around the house, preparing your own meals, walking from one room to another, standing up from an armless straight chair, getting in or out of bed, eating or drinking from a glass, dressing yourself. Responses to these questions by level of difficulty were obtained: no difficulty, some difficulty, much difficulty, or unable to do. Additionally, two summary questions indicating a need for help from other persons with personal care needs or routine needs due to any impairment or health problem and the use of assistive devices to get around will be analyzed. Unfortunately data on functional impairment were not collected in earlier ARIC surveys. As a proxy for these measures we will use variables that are available. One asked participants if they used a wheelchair, crutches or walker or walked with a cane at visit 1. The second (asked immediately prior to visit 1) determined if the participant would need assistance climbing steps or getting around the clinic during their first ARIC examination visit. Participants who responded positively to either of these items will be excluded from analyses of functional health.

Self-rated health will be assessed from the annual follow-up questionnaire. Participants who rated their health as poor at baseline will be excluded from analyses of self-rated health.

We will use the following data from ARIC:

Identification information:
   Participant identification number (visit 1 - 4)
   Visit date (visit 1 & 4)
   ARIC field center (visit 1)

Demographics:
   Ethnicity (visit 1)
   Gender (visit 1)
   Date of birth (visit 1)
   Age (visit 1 & 4)
   Marital status (visit 4)
   Number of household members (visit 4)

Anthropometrics (visit 1 - 4):
   Weight
   Height
   BMI

Diet (visits 1 & 3):
    Frequencies of consumption of foods from 66-item FFQ
    Total energy (kcals)
    Protein (g, % kcals)
    Carbohydrates (g, % kcals)
    Total fat (g, % kcals)
    Saturated fat (g, % kcals)
    Monounsaturated fat (g)
    Polyunsaturated fat (g)
    Cholesterol (mg)
    Dietary fiber (g)
    Sucrose (g)
    Vitamins
    Minerals

Alcohol consumption (visits 1 & 4):
    Alcohol (g)

Functional health (visit 4):
    Physical Ability Questionnaire

Annual Follow-up Questionnaire:
    Functional Status
    Self-rated health
    Date of annual follow-up

Others:
    Smoking (visit 1 & 4): smoking status and # of cigarettes
    Physical activity (visit 1 & 3)
    Education (visit 1)
    Prevalent CHD (visit 1)
    Incident CHD (visit 2-4, annual follow-up)
    Prevalent cancer (visit 1)
    Incident cancer (visit 2-4, annual follow-up)
    Prevalent stroke (visit 1)
    Incident stroke (visit 2-4, annual follow-up)
    Hypertension (visit 1-4)
    Diabetes (visit 1-4)

Exclusions:
    Minorities other than African American
    African Americans residing in Minnesota and Maryland
    Participants with coronary heart disease, stroke, cancer, or diabetes at baseline
    For analyses with functional health as the outcome, participants with impaired
        functional health at baseline assessed by proxy variables will be excluded
    For analyses with self-rated health as the outcome, participants with poor self-rated
        health at baseline will be excluded

7.a. Will the data be used for non-CVD analysis in this manuscript?   __X_ Yes   ____ No

   b. If Yes, is the author aware that the file ICTDER02 must be used to exclude persons with a
      value RES_OTH = "CVD Research" for non-DNA analysis, and for DNA analysis
      RES_DNA = "CVD Research" would be used?   __X_ Yes   ____ No
      (This file ICTDER02 has been distributed to ARIC PIs, and contains
      the responses to consent updates related to stored sample use for research.)

8.a. Will the DNA data be used in this manuscript?   ____ Yes   _X__ No

8.b. If yes, is the author aware that either DNA data distributed by the Coordinating Center must
      be used, or the file ICTDER02 must be used to exclude those with value RES_DNA = "No
      use/storage DNA"?   ____ Yes   ____ No

9.   The lead author of this manuscript proposal has reviewed the list of existing ARIC Study
     manuscript proposals and has found no overlap between this proposal and previously
     approved manuscript proposals either published or still in active status. ARIC Investigators
     have access to the publications lists under the Study Members Area of the web site at:
     http://bios.unc.edu/units/cscc/ARIC/stdy/studymem.html

     __X___ Yes   _____ No

10. What are the most related manuscript proposals in ARIC (authors are encouraged to
    contact lead authors of these proposals for comments on the new proposal or
    collaboration)?

    Manuscript #830 "Association between body composition and functional and self-rated
    health in a bi-ethnic cohort: The ARIC Study"

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